

Revision of the Linnean Types of Palæarctic Rhopalocera. By ROGER VERITY, M.D., F.It.E.S., F.Fr.E.S. (Communicated by the President.)

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THE kindness of Dr. B. Daydon Jackson has enabled me to examine the insects of the Linnean collection, which, as is well known, was purchased and brought to England in 1784 by Dr. J. E. Smith, and subsequently became the property of the Linnean Society.

Unfortunately the types of all the insects described by Linnæus were not in his collection, as he also largely used that of the Baron Charles De Geer, now preserved in the Royal Academy of Science in Stockholm, and that of the Queen Ludovica Ulrica, which is now in the Uppsala University.

Most of the Palæarctic Rhopalocera belonged, however, to Linnæus, as will be seen in the following pages; and the opportunity I have had of examining them has enabled me to make observations which cast light on several points of interest. Some of these have been the object of long controversies amongst entomologists, owing to insufficient original descriptions, and others reveal mistakes which have been carried on for a century and a half, and which were so thoroughly rooted by habit that nobody ever suspected their existence. I hope in consequence that this note may prove to be of some interest, and that it will encourage others to do a similar work on the other Rhopalocera and on the Heterocera, which, I have no doubt, would yield as interesting results.

Dr. Daydon Jackson's thorough knowledge of the works and life of Linnæus has been of invaluable assistance to me. Thus it is important to know that he received many insects from Erik Brander, who was Swedish Consul at Algiers from 1753 to 1765: consequently the types of some of the common European species actually are African, and the "nimitypical" race is that which flies in Africa, as will be observed. Linnæus also had several correspondents in Germany and one in Hungary, as may be inferred by the localities of his insects. I have found no evidence that Kähler, who collected plants for him in several Italian localities, ever furnished him with insects.

One of the difficulties met with in working out the Linnean specimens is due to the great amount of examples that Smith added to the collection. However, after I had acquired some practice, I found that I could separate the insects nearly always with absolute certainty, availing myself of several data:—(1) the labels in Linnæus's own handwriting; (2) the pins which

he used and which were longer, thicker, and coarser than Smith's; (3) the way the wings were set; (4) the important fact that Linnæus marked in his own interleaved copy of *Syst. Naturæ*, XII. edit., every species he possessed specimens of, by underlining with ink the number corresponding to it. With but one or two exceptions, I have been able to find all the specimens thus recorded; and in some instances I found a specimen labelled by him in the collection, but which he had evidently forgotten to mark in the book. Smith followed the same method, but fortunately always used pencil-marks.

It must furthermore be borne in mind that, as regards the species described in the work on the Queen Ludovica Ulrica's Museum (few in the case of Palæartic), Linnæus's specimens cannot be regarded as the actual "types," but only as "co-types." We know that the Queen presented Linnæus with duplicates when she possessed more than two examples, and we also learn from Brander's letter, dated 23rd of August, 1756, that he used to send series of specimens both to the Queen and to Linnæus.

Entomologists do not seem to have in all cases noted in which of Linnæus's works the first description of the different species appeared; so I have thought it useful to mark the date of the original description after each one, and it should be understood that they refer to the following works:—

- 1758. *Systema Naturæ*, X. edit.
- 1761. *Fauna Suecica*, II. edit.
- 1764. *Museum Ludovicæ Ulricæ*.
- 1767. *Systema Naturæ*, XII. edit.

In the following list of Linnean species I have adopted the modern generic nomenclature and classification, so as to render reference easier; at the head of each paragraph I have noted the specimens which I have been able to recognise with certainty as Linnean, and added a few observations which I think may be of some interest.

In all cases in which the examination of the types seems to necessitate alteration in nomenclature, I have endeavoured to set forth as clearly as possible the grounds on which I venture to suggest these alterations, with a view to coming to a definite settlement. At the end of this paper a list of these alterations is given.

The species marked by Linnæus as being in his collection are in the following pages marked by an asterisk, thus, *.

**PAPILIO PODALIRIUS* [(1758)–1764]. Only one Linnean specimen, which bears this name in Linnæus's handwriting. It is a female of the butterfly generally known as *P. feisthameli*, Dup., African summer brood *lotteri*, Aust.—The other specimen which accompanies it bears a date (1786) posterior to the transference of the collection to England.

If one goes over the earlier literature concerning the name *podalirius*, we find that it figures amongst the very first created by Linnæus, but unfortunately in a very unsatisfactory way: it is only mentioned in a short footnote on p. 463 of the X. edit. of 'Systema Naturæ'; no description accompanies it, but only the following quotations: Ray, *Historia Insectorum*, p. 111. n. 3 (1710); Réaumur, *Hist. des Insectes*, i. pl. 12. figs. 3, 4 (1734); Rösel, *Collect. of Insects*, i. classe ii. pl. 2 (1746). Linnæus then gives Southern Europe as habitat, and adds that this butterfly is so similar to his American *protesilaus* that a thorough acquaintance with their early stages will alone prove whether they are to be considered specifically distinct.

Evidently Linnæus was not personally acquainted with this insect in 1758. When Brander's African specimens reached Sweden the author of 'Systema Naturæ' cancelled with a few pen-strokes on his own copy of the book the footnote referring to *podalirius*, and in 1764 published a lengthy description of the African species he had in hand, under the same name of *podalirius*.

If it be borne in mind that the three authors quoted by him figure or describe the species which is more widely distributed in Europe, as is ascertainable by referring to their works, it comes to be clear that Linnæus applied a single name to two insects which the most recent observations have proved to be specifically distinct*.

We are thus confronted with the question, for which of the two ought the name to be used? and it seems to me that the most satisfactory plan is to consider, as its own author did, the first mention of the name in 1758 as null: the lack of any description, and the imperfect and incorrect statements accompanying it proving that Linnæus did not know the insect he was mentioning, would, according to my views, be quite sufficient; furthermore, the original description of 1764 is given full value by the documentary evidence of one of the very specimens from which it was drawn.

If this were not enough, one might also add that before Linnæus's description was published the European species had already been carefully described and figured by the first author who took up the new nomenclature, Nicolaus Poda. In his 'Insecta Musæi Græcensis' (1761) he gave such a good figure of a female of the summer brood that it can be readily identified, and, never suspecting it was the insect mentioned by his master in the aforesaid footnote, he gave it the name of *P. sinon*.

This name I propose to validate as specific. If it be accepted, several alterations will be found necessary amongst the names of the different races and broods. The summer brood becoming nymotypical, the spring brood will have to receive a name instead: *flammaus* of Fourcroy, *Entom. Paris*,

* See R. Verity, 'Rhopalocera Palæarctica,' p. 293. I emphasize the fact that *P. sinon* and *podalirius* (= *feisthameli*, Dup.) both fly together in Spain and Portugal and even down to Tangier in Morocco.

ii. p. 242 (1785), cannot be adopted, because its description gives no clue as to what generation the type belonged. In consequence, a name must be created, and I propose that of *vernus*.

As regards the Hispano-African species, it will be found useful to maintain the name *feisthameli*, Duponchel, whose original figure represents the Spanish summer brood, to distinguish it from the nimotypical African race, quite distinct from it in all the broods (see Synopsis of Alterations at the end of this note).

*PAPILIO MACHAON [1758]. The specimen, which is certainly Linnean and which bears his label, is a female of the first (or only) brood of a northern race, as may be inferred by its light yellow ground-colour, short tails, and narrow transverse bands, with their inner contour undulating but not produced in sharp dents. Another specimen, of doubtful origin, is certainly southern, and a third is a British specimen from the Smith collection.

THAIS RUMINA [1758]. No Linnean specimen.

*PARNASSIUS APOLLO [1758]. No specimen bears a Linnean label, but everything points to the fact that one of the three specimens in the collection was Linnean. It is a female of large size of the Scandinavian race. Two more specimens, from Italy, are Smith's.

*PARNASSIUS MNEMOSYNE [1758]. A male and a female, the first of which is labelled by Linnæus. These two specimens evidently come from the same locality; they are of a large, very white race, with the black markings much reduced and no white patches in the vitreous marginal band. They probably come from Finland, which locality Linnæus gives as only habitat in his original description; but, as he adds Hungary in the XII. edit. of the Syst. Nat., I could not certify these specimens are not Hungarian, owing to the resemblance of certain individuals of the two races. At all events, it seems plausible to consider the northern race as nimotypical †.

*APORIA CRATÆGI [1758]. One male specimen labelled by Linnæus is distinctly of Scandinavian origin; the other English specimen is not Linnean.

*PIERIS DAPLIDICE [1758]. The specimen, which is obviously Linnean and bears his own label, is a female of the summer brood; another female and a male are probably from Linnæus's collection as well. They all three belong to the large European race, with the black markings widespread and their outlines diffused and with broad and vividly green markings on the underside, contrasting with the form or race, as the case may be, *nitida*, Verity.

† See 'Rhopalocera Palearctica,' p. 320.

*PIERIS NAPI [1758]. Only one specimen; this is obviously Linnean, and bears his label. It is a male of the Scandinavian race: small, basal suffusion of wings widespread and very black; apical marking extending far backwards along outer margin; on the underside neuration of fore wings distinctly bordered with grey scaling, that of hind wings with very broad and very dark olive-green veins. The female is English and has been added in by Smith.

The Linnean "type" is identical with the specimen I have figured in 'Rhopalocera Palæarctica,' pl. 32. fig. 32, *i. e.* to the race which on p. 333 I discussed and proposed to distinguish under the name of *arctica*, assuming the nymotypical form to be the common spring form of Central and Southern Europe. In reality the Scandinavian race is more closely allied to the Alpine *bryoniae* than to the so-called *napi*, but as it seems to constitute a sort of intermediate race between the two, I should not be inclined personally to substitute the name of *napi* for that of *bryoniae* simply on this ground; moreover, the present state of things regarding this group of *Pieris* is very unsatisfactory, and as yet we have reached no definite conclusion as to the biological degree of distinctness between *napi*, *bryoniae*, *ochsenheimeri*, *frigida*, and the allied North-American butterflies.

Suffice it, then, now to have established that the Scandinavian race is the nymotypical one, and to distinguish from it the well-known butterfly of Central and Southern Europe whose summer brood Esper has named *napaea*, and which in the first generation, though more similar to *bryoniae* and the Linnean *napi*, can be distinguished from it by its larger size, more elongated wings, very reduced basal suffusion, shorter apical black crescent, shadeless neuration of the underside of fore wings, narrower, more sharply outlined and more vividly green veins of hind wings, and by the fact that the female never offers examples of the form with yellow ground-colour and ample brown suffusion.

I propose the name of *vulgaris*, taking as typical the first brood of the neighbourhood of Florence (Italy), because amongst the races I know it is that which keeps most constantly distinct from the Linnean one.

If it be biologically proved in future that this butterfly is specifically distinct from *bryoniae*, no doubt the Linnean race will have to be grouped with this last and *vulgaris* will rise to specific rank as compared with *napi*, whilst the name *bryoniae* will serve to differentiate the Alpine race from the Arctic one.

*PIERIS RAPÆ [1758]. The only Linnean specimen bears his label. It is a male of the first brood, with pale grey apical crescent, no discoidal spot, and underside of hind wings suffused with a thick black dusting; presumably Scandinavian.

Thus we find that the Linnean nymotypical form of this species is identical with *metra*, Stephens (1827), and *immaculata*, Fologne (1857), and that it is

the summer brood, whose characters are too well known for me to describe them here, which ought to be distinguished by a name; according to my views on the subject †, I propose that of *activus*.

**PIERIS BRASSICÆ* [1758]. The only Linnæan specimen bears his label. It is a ♂ of the first brood, with pale grey apical crescent and underside of hind wings suffused with a thick black dusting.

What has been said of *rapæ* can be repeated here, and the name *chariclea*, under which Stephens described the first brood as a distinct species in 1827, falls into synonymy; however, in this case we have already for the summer brood the name of *lepidii*, proposed by Röber in 1907.

**EUCHLOË CARDAMINES* [1758]. There exist four Linnæan specimens, two of each sex; they are alike: large apical crescent both on upper and under sides, very widespread and very dark green pattern on the latter side of hind wings, with no traces of yellow. The characters of a northern race are thus developed to a high degree and fully justify the names given to other races.

**EUCHLOË BELIA* [1767]. Under this name there exist two specimens, one of them bearing Linnæus's label; they are both females of the species which is generally known as *eupheno*, Linn.

EUCHLOË EUPHENO [1767]. No specimen, and in fact not marked by Linnæus as being in his possession.

In the XII. edit. of *Syst. Nat.* Linnæus describes under the names of *belia* and of *eupheno* the female and the male respectively of a single species. Cramer overlooked this fact, and having evidently also overlooked the character of "rufous apex" given in the description of *belia*, he figured in 1782, under this name, a species which Linnæus had never known. Butler, in 1869, pointed out this mistake and proposed the name of *crameri* for Cramer's insect. As, however, up to the present date nobody knew what butterfly Linnæus's *belia* was, entomologists have preferred to consider it as null, and Butler's name has had no success. Now that it is known, it seems obvious that, as it is desirable to come to some definite settlement based on positive facts, the most reasonable view to take is that of re-establishing the name *belia* for the species it was created for and re-enforcing Butler's name for Cramer's insect. Let it also be noticed that in *Syst. Nat.* the name *belia* stands before *eupheno*, so that, strictly speaking, according to the International Rules of Nomenclature, it also has the right of priority over the latter, and furthermore that the types of *eupheno* are for the present unknown, so that it is only the habitat "Barberia" which gives a clue as to what species Linnæus meant it for, his brief description fitting *euphenoïdes* as well. Staudinger did not accept Butler's and Kirby's suggestion of re-establishing

† See 'Rhopalocera Palearctica,' p. liv.

the name *belia* in the place of *eupheno*, on the ground that Linnæus's description of the former might have been meant for another Algerian species, *T. omphale*. This view cannot stand if one remembers that in the times of Brander no European had ever got to the southern desert regions haunted by *omphale*.

*LEPTIDEA SINAPIS [1758]. The specimen labelled by Linnæus is a male of the spring brood with very large diffused apical patch of grey at apex and very abundant and dark scaling on underside of hind wings; another specimen is a male of the summer brood, very near the form known as *dimiensis*, Boisd., and bears the locality "Hung." in Linnæus's handwriting (it is the only Linnean specimen I have seen with a locality attached to it!).

The original description of this species applies as well to the summer as to the spring brood. The specimen which has been labelled by Linnæus is to all appearance Scandinavian, and, strictly speaking, it probably ought to be taken as the type, because Linnæus presumably only received his Hungarian insects after the X. edit. of Syst. Nat. was published; this may be inferred by the fact that he gives the habitat Hungary for *P. mnemosyne* only in the XII. edit.

This consideration does not seem, however, to be of sufficient value to oblige us to drop the well-known name of *lathyri*, Hübn., for the first brood.

*COLIAS PALÆNO [1761]. The specimen bearing the Linnean label is in no way the insect which is known under this name; it certainly belongs to the same group, having the underside of hind wings thickly suffused with dark scaling, and a silvery discoidal spot devoid of any ring, but its bright yellow upperside and narrow marginal band with a slightly undulating inner margin and yellow veins partially intersecting it distinguish it promptly; the only butterfly I could refer it to is the American *alexandra*, Edw., whose habitat, however, makes it highly improbable that Linnæus should have obtained it. Two more specimens, which are unmistakably Linnean, are a male and a female of the Scandinavian race of *palæno*.

As the original description is in 'Fauna Suecica,' I should think there was no doubt that Linnæus meant it for the butterfly of his country which he was well acquainted with, and there is no reason to alter the present nomenclature.

*COLIAS HYALE [1758]. Two males and a female, which all have the look of Linnean specimens and seem to be of the summer brood.

*GONEPTERYX RHAMNI [1758]. The Linnean specimen is a male of the northern race: small, light yellow, discoidal spots so small and pale as to be nearly invisible.

Thus Röber is fully justified in having named the race from Africa and Asia Minor, which is transitional to *farinosa*, and I think it equally useful to distinguish the race from Southern Europe, which is intermediate between the race of Linnæus and that of Röber: I therefore suggest giving it the name *transiens*, taking as typical the Italian specimens in my collection.

*GONEPTERYX CLEOPATRA [1767]. A ♂, which is obviously Linnæan, and bears his label, unmistakably belongs to the North African race, as may be seen by its rich colouring, by the orange patch of fore wings nearly reaching the external margin, by the underside of a vivid green with a slightly milky appearance.

All these characters correspond to those of the race which Röber named *mauritanica*; furthermore, Linnæus only gives Barbaria as habitat of this species. There is, in consequence, no doubt that the nymotypical race should be the African one, and as the European one is quite distinct from it, I propose to designate it by the name of *europæus*, taking as typical that which flies during the spring in the neighbourhood of Florence (Italy); the form which is produced by extreme heat has already received the name of *italica*, Gerh., but it is by no means the commonest form even in the height of summer.

*CHARAXES JASON [1758] = *jasius* [1767]. The Linnean specimens are a male and a female of the North African race, as proved by their large size, dark colouring, long tails, and chiefly by the very small size of the greyish-blue spots which, on the hind wing, precede the yellow marginal band.

As in the case of *G. cleopatra*, the only locality given by Linnæus in the XII. edit. of Syst. Nat. is Barbaria (in the X. edit. and in Mus. Lud. Ulr. the locality "India" is obviously erroneous!). The nymotypical race is thus proved to be the African one, and, as that which flies north of the Mediterranean can be constantly separated from it by its inferior average size, by its lighter colouring, shorter tails, and much wider and more prominent blue spots on hind wing, often blending in a continuous band, I think it should be designated by a name. The specimens which are to the greatest degree removed from the African ones are, to my knowledge, the Tuscan, and I propose to take them as typical of a race *septentrionalis*.

*APATURA IRIS [1758]. There exist four specimens which are obviously Linnean, and two English specimens added by Smith. Of the first, one is a male of the insect generally known as *ilia*, and bears a label of Linnæus, "*iris*"; another is a male of its form *clytie*, and equally bears the name "*iris*" in Linnæus's handwriting; a third is a female of this last; and a fourth is a male of the species generally called *iris*: it is set so as to show the underside.

If we now turn to the Linnean literature on the subject, we find that Linnæus's original description, which he afterwards simply transcribed, is

quite insufficient for us to make out what species it is to be referred to. Fortunately, however, Linnæus has furnished us a clue which proves that the specimen labelled *iris* by him is actually the one he intended to describe. In his own interleaved copy of the X. edit. of 'Syst. Naturæ' he has added a side-note which evidently can only be ascribed to the character distinguishing *ilia* auctorum from *iris* auctorum on the upper side of the wings. I quote the description of the fore wings and add the hand-written note inclosed by brackets: "Primores supra maculis albis sparsis in medio & exterius [et ocello nigro inde ferrugineo]."

It seems to me that those who wish to establish nomenclature once for all on grounds which are not open to criticism will find it advisable to correct the mistake made nearly a century and a half ago, and to re-establish the name *iris* for the species of which Linnæus has left us two types. In consequence, I venture to suggest that the name *pseudoiris* should be adopted for the false *iris* of authors.

LIMENITIS POPULI [1758]. Though this species is not marked by Linnæus as being represented in his collection, there exists a specimen labelled by him. It is a male with well-marked white bands.

LIMENITIS SIBILLA [1758]. Of this species there exists no example bearing a Linnean label, but one of the specimens strongly suggests a Linnean origin.

*GRAPTA C-ALBUM [1758]. The Linnean type belongs to the form with very dark underside; three more specimens have been added by Smith.

*VANESSA IO [1751]. No specimen from the Linnean collection is now in existence.

*VANESSA ANTIOPA [1758]. It is very likely that the typical specimen is of American origin, being small and having a narrow marginal band. Linnæus quotes America as well as Europe, showing he had received it from the New World.

*VANESSA POLYCHLOROS [1758]. Linnæus's specimen is remarkably small and light-coloured on the underside.

*VANESSA URTICÆ [1758]. What has been said of *V. io* may be repeated here.

*PYRAMEIS ATALANTA [1758]. The example labelled by Linnæus is of the commonest form, with moderately wide crimson bands.

*PYRAMEIS CARDUI [1758]. There is nothing noteworthy about the one typical specimen.

**ARASCHNIA LEVANA* [1758]. As in last species.

ARASCHNIA PRORSA [1758]. Linnæus describes this brood as a species distinct from *levana*, but evidently did not possess it.

**MELITÆA MATURNA* [1758]. A male and a female, unmistakably of Linnean origin. In the former bands of a fine red stand out on the lighter ground-colour of the wings.

**MELITÆA CINXIA* [1758]. The type is a small, but brightly coloured, ♀ of the Scandinavian race, and presumably comes from the Botanical Garden of Uppsala, which Linnæus, in 'Fauna Suecica,' gives as the habitat of this species.

**ARGYNNIS EUPHROSYNE* [1758]. One small example from the collection of Linnæus.

ARGYNNIS DIA [1767]. Described from an Austrian specimen, but not possessed by its author.

**ARGYNNIS NIOBE* [1758]. There exist two Linnean specimens, one of which bears a label in his handwriting. They are two males, exactly alike, and belonging to the form with no silver markings on the underside of the hind wings, except some minute specks in the pupils of the rusty spots which stretch across the wing within the light-coloured space.

If one refers to the original description we find that it exactly answers to these specimens, so that this should be considered the nimitypical form, and the name *eris*, which has so long been used for it, should be sunk in synonymy.

**ARGYNNIS CYDIPPE* [1761] = *ADIPPE* [1767]. The specimen which bears this name in Linnæus's handwriting, and which in every respect is unmistakably of Linnean origin, is a female of *A. niobe* and belongs to the so-called nimitypical form of this species with silver spots on the underside developed to the highest degree.

This startling observation enables me to point out a gross mistake made by Esper in 1777, which has been continued for nearly a century and a half. Linnæus's description agrees in every respect with the specimen labelled by him "*cydippe*" (a name which he changed in 1767 into *adippe*), but as he described this female as a species distinct from *niobe*, owing to the variability of the underside, and as his description was not accurate enough to convey exactly what he meant it for, Esper did not hesitate to attribute it to the only similar European species without a name. The result is that down to this day the latter has remained without one.

The name *syrinx* was proposed by Borkhausen for an abnormal pair figured by Esper, and the name *berecynthia* of Poda is accompanied by such a vague description that it is impossible to make out what species it is meant for ; so that, according to my view, the best plan we can adopt is to dedicate this species to the entomologist who discovered it, and name it *esperii*, taking his figures as typical.

The name *cydippe* can stand for the form of *niobe* with silver markings, and the alteration suggested by Linnæus six years after naming it had better be discarded to obviate confusion.

ARGYNNIS AGLAJA [1758]. A pale female example bears the Linnean label

*ARGYNNIS LATHONIA [1758]. The type of Linnæus belongs to the small and pale northern race.

*ARGYNNIS PAPHIA [1758]. One male specimen from the Linnean collection is unmistakably of northern origin, as may be seen by the very prominent bands and spots on the underside of the hind wings.

*MELANARGIA GALATHEA [1758]. The female labelled by Linnæus is a large example and belongs to the dark form of this species, contrasting sharply with the smaller and much lighter British race, of which specimens have been added by Smith.

*EREBIA LIGEA [1758]. Two specimens, a male and a female, are unmistakably Linnean, and obviously belong to the same race of the species, a northern one, being smallish and rather dull in colour. The female bears the name in Linnæus's handwriting. A third specimen, of the male sex, is probably also Linnean.

*SATYRUS HERMIONE [1764]. The specimen which bears this name in Linnæus's handwriting unmistakably belonged to his collection. It is a male of the species generally known as *alcyone*, Schiff., and all its distinctive characters are most prominently marked. It belongs to a Central-European race, with the white band on the upperside of the fore wings rather conspicuous and containing two ocelli. Another specimen, which is certainly also of Linnean origin, is a male of the species known as *hermione* and of a Central-European race of small size, with rather inconspicuous white bands. It is set so as to show the underside.

If we refer to Linnæus's original description we find that, on the whole, it is insufficient to enable us to make out which of these two species he meant it for (and the figures he quotes as representing his *hermione* are very good reproductions of *fidia* in one instance and of *circe* in the other !), but one character he mentions is worthy of attention : he describes the band of the underside of the fore wings as being tawny in colour ; as this is the very

character which, in a rough way, is the best to distinguish *alcyone* from *hermione*, and as the individual labelled by Linnæus possesses it to the very highest degree, there can be no doubt that that specimen actually belongs to the species Linnæus meant to describe.

If this conclusion be accepted, it is clear that *alcyone* must become synonymic of *hermione*, and that we must turn somewhere else to find the name to be adopted for the other closely allied species. It must be noted that Scopoli in 'Entomologia Carniolica' had described a *Satyrus* of this group a year before Linnæus; but unfortunately it is utterly impossible to make out from his description which species it is, so that his name *fagi* can only be regarded as non-existing. We next come to Esper, and we find that he clearly saw the differences between the two allied species and figured them under the names of *hermione major* and *hermione minor*. The first must evidently be adopted, although it unluckily is anything but highly recommendable to stand as specific.

SATYRUS FIDIA [1767]. Linnæus never possessed this species and never seems to have realised that Petiver's figure in 'Gazophylacium,' 12, pl. 7. fig. 5, which he quotes under *hermione*, in reality represents this insect.

SATYRUS SEMELE [1758]. Although not marked in Linnæus's copy of Syst. Nat., there exists a female specimen from his collection; it is of the small northern race.

**SATYRUS BRISEIS* [1764]. One specimen unmistakably Linnean; it is obviously of German origin, and, in fact, that is the habitat given with the original description.

**SATYRUS PHÆDRA* [1764]. One Linnean male, evidently from the same locality as the last.

**EPINEPHILE JURтина* [1758]. The specimen bearing the Linnean label is a fine female of the North-African race, usually known under the name of *fortunata*, Alph.

As this name stands in Syst. Nat. before *janira*, Staudinger has done well to point out that, according to the accepted rules, it has the right of priority, but, now we know that the type is of African origin, we must furthermore add that this race should be considered as nymotypical and Alpheraky's name sunk in synonymy; it must also be noted that Linnæus gives Africa as well as Europe as habitat of *jurtina*, showing he knew of females from both localities.

**EPINEPHILE JANIRA* [1758]. The insect labelled by Linnæus is a small male of the preceding species with very inconspicuous apical ocellus and no trace

of tawny band on the upperside. It obviously belongs to the Central-European race, and this view is confirmed by the fact that Europe is the only locality given, proving that Linnæus had never received any males from Africa†.

We can thus come to the conclusion that the name *janira* should be used to designate the European race of *jurtina*, taking as typical of the former the Central-European one.

EPINEPHILE TITHONUS [1771]. No specimen of Linnean origin of this species, which was described in 'Mantissa Plantarum,' p. 537, from specimens of a German race.

[*PARARGE DEJANIRA [1764]. A male of this species, over which Scopoli has a right of priority, having described it in 1763 under the name of *achine*.]

PARARGE ÆGERIA [1758]. Linnæus does not seem to have possessed this species, for which he gives Southern Europe and Africa as habitat.

PARARGE MEGERA [1767]. There seems to be some confusion in the Linnean collection concerning these two species: a female specimen of *megea* seems quite Linnean and bears a label on which "17 æger." is written in his handwriting; another label in Smith's handwriting points out the mistake, about which there can be no doubt, as the original descriptions of the two species are quite clear. Austria and Dania are given as localities for *megea*.

PARARGE MAERA [1758]. This species is not marked as having been represented in Linnæus's collection, but four specimens are unmistakably of Linnean origin. Furthermore, one of them, a female, bears a label with this name in his own handwriting; another, a male, bears the name *philippus* traced by the same hand, and is set so as to show the underside—the latter name does not appear in any of Linnæus's works; a third specimen is a female exactly similar to the first, and the fourth is a male of the species which Fabricius described later as *hiera*—these two examples have no label.

The three *maera* just mentioned are quite typical of the very definitely distinct race which flies in Scandinavia: small size; no trace of tawny band in the male, very rudimentary (if present at all) in the female; underside of fore wings entirely chocolate-brown with a small patch of deep mahogany-red, that of hind wings abundantly suffused with dark shadings; on the whole, this race looks much more similar to *hiera* than it does to other *maera*, and

† This was probably the principal cause which led him to describe them as a distinct species.

it would be nearly impossible to separate them in some cases if it were not for the characters of the central streak of the fore wings. The Central-European forms having always been regarded as nymotypical of the species, Schilde suggested distinguishing the Scandinavian one by the name of *monotonia*. Here, as in other instances, it would be wise to settle nomenclature once for all on the base of positive facts ; so I suggest abolishing the latter name and giving one to the race from Central and Southern Europe which is exactly intermediate between the two extreme variations of the species—the Linnean and *adrasta*. It is by far the most widely distributed of the three, and even within its range interesting local races can be detected ; so, to fix it more exactly, I propose to take as typical of my *vulgaris* that which flies in the neighbourhood of Florence (Italy). It is not so large as some of the Alpine races, but it has the advantage of being very constant. The male has traces of a tawny band above, the female has one constantly, and generally also a small indefinite patch of the same colour within its inner margin ; the underside of fore wings has a uniform tawny ground-colour, and the hind wings a clear uniform grey one, on which the transverse stripes stand out well. All these characters contrast with those of the Linnean race.

*APHANTHOPUS HYPERANTHUS [1758]. A male and a female from Linnæus's collection are of the small form with smallish ocelli.

*CÆNONYMPHA PAMPHILUS [1758]. Two Linnean specimens of the small northern race, with hind wings dark on the underside and bearing a well-marked white band.

CÆNONYMPHA HERO [1761]. Not possessed by Linnæus. Sweden given as the habitat.

CÆNONYMPHA ARCANIUS [1761]. Though not marked as possessed by Linnæus, there are two specimens which unmistakably come from his collection, and one bears a label of his. They belong to a very small northern race and are presumably Scandinavian. The marginal black bands of wings are very wide ; on the underside the white band of hind wings is narrow and the ocelli small.

*NEMEOBIUS LUCINA [1758]. Two Linnean specimens.

*THECLA PRUNI [1758]. One male bearing the Linnean label ; it is of the form with only one small orange lunule near anal angle of hind wings on upperside and with a narrow orange band on underside. Another specimen, which is evidently from the collection of Linnæus, is a *T. ilicis* with orange patch on fore wing ; he probably took it to be specifically identical with *pruni*.

*ZEPHYRUS BETULÆ [1758]. The example labelled by Linnæus is a female with a large orange patch on fore wings; a male specimen is unmistakably Linnean as well.

*ZEPHYRUS QUERCUS [1758]. A male from the Linnean collection is evidently of European origin.

*CALLOPHRYS RUBI [1758]. The one Linnean specimen is a female, unmistakably of the northern race, as may be seen by its small size, dark underside, and chiefly by the complete absence of any white streak.

Thus the names of *borealis*, Krul., and *polaris*, Möschl., by which this race had been distinguished, have no reason to exist; and, assuming it to be the nymotypical one, it is the race commonly distributed in Central and part of Southern Europe which should be designated by a name: that of *virgatus* seems to me appropriate for it. Its characters are intermediate between the Linnean race and those of *fervida*, Stdgr., from the warmest portions of the habitat of *rubi*. The names *immaculata*, Fuchs, and *punctata*, Tutt, are useful to indicate its extreme individual variations.

*CHRYSOPTERUS VIRGAUREÆ [1758]. Three Linnean examples, of which one bears a label. They belong to a small and pale northern race, with markings on the underside very reduced in size and number.

The habitat given by Linnæus being Westmania, there is little doubt that these specimens are from that locality. As in the case of the European *Parnassii*, &c., it will probably be found convenient to separate from this distinct northern race that of the mountains of Central Europe, always distinguishable by its larger size, much brighter colouring, and more prominent markings of underside; the male on upperside has a richer redder tone than is ever the case in Scandinavia. I propose for it the name of *inalpinus*. I think the name of *oramula*, given by Freyer to the extreme northern form from Lapland, can be preserved, as that race is not identical with the nymotypical one, being still smaller and paler. The race which stands furthest from the latter is, to my knowledge, the large and boldly marked *virgaureæ* of the Maritime Alps in Piedmont (Valdieri, 1400 m.); so it might be taken as typical of *inalpinus*.

*CHRYSOPTERUS HIPPOTHOË [1761]. The two Linnean specimens in existence are males of the species which is generally known under this name. They evidently belong to a northern race and are presumably Scandinavian, as Linnæus describes this species in 'Fauna Suecica.' They present characters intermediate between those of the form which is generally considered as nymotypical and the characters of the Alpine form *eurybia*, Ochs., agreeing with the latter by their small size, dull colouring, and diffused black shadings,

and with the former by the presence of a small amount of violet scaling along the costal margin. The specimen which bears the label of Linnæus is an aberrant one: on the underside of both fore and hind wings the two series of ocelli which precede the submarginal orange band are confluent, and give rise to a single series of wedge-shaped streaks, as in the specimen figured by Gerhard under the name of ab. *confluens*.

The fact that we have the Linnean type of this species under our eyes is very interesting, because it had been held in doubt by many entomologists whether the species which is generally known as *hippotoë* was really that which Linnæus intended to describe, and whether it was not more likely to be *C. dispar*. The point of this controversy is now evidently settled.

An error of secondary importance, which, however, I think it would be well to rectify once for all, as in the case of other species, is that regarding the nimotypical race. The Central-European one has always been regarded as such, and, accordingly, *eurybia* from the higher Alpine ranges and *stieberi* from Lapland had been described as varietal forms. On the contrary, we now know that Linnæus's types are identical with the latter and nearer allies to the former than to what was considered the nimotypical form; so that the most beautiful and highly specialised race of *hippotoë* in which both sexes are vividly coloured—the male being of a very bright reddish copper on upperside with a strong purple gloss, and presenting a distinct orange submarginal band on underside—has to this day remained unnamed. I propose the name of *mirus*, taking as typical of it the race which flies in the Pyrenees and which is quite similar also to the German one (Cassel, Berlin, etc.); to my knowledge it is furthest removed from *eurybia*.

**CHRYSOPHANUS PHLEAS* [1761]. No Linnean specimen in existence now.

LAMPIDES BÆTICUS [1767]. Linnæus gives Barbaria as habitat for this species, but it was not represented in his collection.

**LYCÆNA ARGUS* [1758]. Two male specimens of Linnean origin, one of which is labelled. They are large, brightly coloured, and very white on underside, and belong to the species to which Staudinger and most previous authors rightly attribute this name.

Few species have been the object of longer debates amongst naturalists than this and the following. These are the only Linnean types, strange as it may seem, which any entomologist has referred to in a direct way, to settle definitely the controversies caused by the insufficiency of original descriptions. Tutt, in fact, examined the two insects, and placed his conclusions before the Entomological Society of London in the meeting of the 17th of March, 1909. I can in this case fully agree with them. As regards

the following species, he seems to have overlooked some facts on which I wish to lay particular stress.

LYCÆNA IDAS [1761]. This insect is not marked by Linnæus in his copy of the XII. edit. of Syst. Nat., because he only quotes it in that work as a synonym of *argus*. There exist, however, two specimens which are unmistakably Linnean. The one which now bears his label is a female with wings entirely brown and one fulvous lunule near anal angle. It is unfortunately one of those specimens of this sex which it is very difficult, if not impossible, to refer with certainty to *argus* or to its near ally. I am personally more inclined to consider it as belonging to the latter rather than to the former. The other Linnean specimen is a most typical female of the species for which Staudinger has proposed the name of *argyrognomon*, Bergstr., and furthermore, curiously enough, it belongs to the blue form of that sex for which the name *argyrognomon* was published, and which Staudinger proposed to name *callarga*. The basal half of the wings is entirely blue, and they bear very prominent fulvous marginal lunules.

Turning our attention to the Linnean literature on the subject, we first find the name *idas* in 'Fauna Suecica' given as "nomen triviale" to the insect which Linnæus had already described before he took to the binomial nomenclature, and in the "nomen specificum" of which he clearly stated that the wings were blue with rufous marginal lunules. This brief description he transcribes in all his following works when quoting *idas*. Curiously enough, in the somewhat more lengthy one which follows it, there is an open contradiction, as it is stated that the wings are entirely brown. It seems to me that the "nomen specificum" from every point of view ought to be considered as the original description of *idas*, the more so seeing that we have before us the striking fact of the existence of the specimen for which the name was created.

Thus we are led to the conclusion that even if the brown specimen is a female of *argus*, it is the blue one which ought to be considered as the type of *idas*; and we can definitely settle the question regarding the names of the two species in a very satisfactory manner by discarding the long-debated name of *ægon*, as was suggested by Staudinger, and by re-establishing the Linnean name of *idas* in the place of *argyrognomon*, which, for several good reasons, had not been favourably accepted by most entomologists as specific.

In any case it will be found necessary to alter the name *idas* given by Rambur to a Spanish species of the same genus, and it might be dedicated to its author under that of *ramburi*.

*LYCÆNA ARION [1758]. The Linnean specimens consist of a darkish male and of a much lighter coloured female.

**CYANIRIS ARGIOLUS* [1758]. The Linnean type bearing his label is a female of the spring brood, as may be seen by its small size, narrow black marginal band, and prominent spots on the underside.

**PAMPHILUS COMMA* [1758]. There are three specimens from Linnæus's collection, two males and a female. One of the former and the latter unmistakably belong to the northern race, being small and dark with prominent quadrangular spaces on the underside.

**HESPERIA MALVÆ* [1758]. One Linnean male of this very constant species. It exhibits to a marked degree the characters distinguishing *malvæ* from *malvoides*, Elw. & Edw.

**THANAOS TAGES* [1758]. The three males which evidently belonged to Linnæus are of the form with dark ground-colour, rendering the black bands and markings very inconspicuous.

Synopsis of Proposed Alterations.

Substitute :	In place of :
<i>Papilio sinon sinon</i> , Poda	<i>Papilio podalirius</i> , auct., <i>zanclæus</i> , Zell.
„ „ <i>vernus</i> , nom. nov.	„ „ <i>podalirius</i> .
„ <i>podalirius podalirius podalirius</i> , L.	„ <i>feisthameli</i> , Dup., <i>lotteri lotteri</i> , Aust.
„ „ <i>maura</i> , Verity, <i>podalirius</i> , L.	„ „ <i>maura</i> „
„ „ <i>podalirius feisthameli</i> , Dup.	„ „ <i>feisthameli feisthameli</i> .
„ „ <i>miegi</i> , Thierry-M., <i>feisthameli</i> , Dup.	„ „ <i>miegi</i> „
<i>Pieris napi napi napi</i> , L.	<i>Pieris napi napi arctica</i> , Verity.
„ „ <i>vulgaris vulgaris</i> , nom. nov.	„ „ „ <i>napi</i> , auct.
„ „ <i>napææ</i> , Esp., <i>vulgaris</i>	„ „ <i>napææ napi</i> .
„ <i>rapæ rapæ rapæ</i> , L.	„ <i>rapæ metra</i> , Steph., <i>rapæ</i> .
„ „ <i>æstivus</i> , nom. nov., <i>rapæ</i>	„ „ <i>rapæ</i> , „
„ <i>brassicæ brassicæ brassicæ</i> , L.	„ <i>brassicæ chariclea</i> , Steph., <i>brassicæ</i> .
„ „ <i>lepidii</i> , Rüb., <i>brassicæ</i> , L.	„ „ <i>brassicæ</i> , „
<i>Euchloë belia</i> , L.	<i>Euchloë eupheno</i> , L.
„ <i>crameri</i> , Butler	„ <i>belia</i> , Cramer.
<i>Gonepteryx rhamnii</i> , L., <i>transiens</i> , nom. nov.	<i>Gonepteryx rhamnii</i> . South-European race.
„ <i>cleopatra cleopatra</i> , L.	„ <i>cleopatra mauritanica</i> , Rüb.
„ „ <i>europæus</i> , nom. nov.	„ „ <i>cleopatra</i> .
<i>Charaxes jasius</i> , L., <i>septentrionalis</i> , nom. nov.	<i>Charaxes jasius</i> . European race.
<i>Apatura iris</i> , L.	<i>Apatura ilia</i> , Schiff.
„ <i>pseudoiris</i> , nom. nov.	„ <i>iris</i> , auct.
<i>Argynnis niobe niobe</i> , L.	<i>Argynnis niobe eris</i> , Mieg.
„ „ <i>cydippe</i> , L.	„ „ <i>niobe</i> , auct.
„ <i>esperi</i> , nom. nov.	„ <i>adippe</i> , auct.

Substitute :	In place of :
<i>Satyrus hermione</i> , L.	<i>Satyrus alcyone</i> , Schiff.
„ <i>major</i> , Esp.	„ <i>hermione</i> , auct.
<i>Epinephile jurtina jurtina</i> , L.	<i>Epinephile jurtina fortunata</i> , Alph.
„ „ <i>janira</i> , L.	„ „ <i>jurtina</i> .
<i>Pararge maera maera</i> , L.	<i>Pararge maera monotonia</i> , Schilde.
„ „ <i>vulgaris</i> , nom. nov.	„ „ <i>maera</i> .
<i>Calophrys rubi rubi</i> , L.	<i>Calophrys rubi borealis</i> , Krul. (= <i>polaris</i> , Möschl.).
„ „ <i>virgatus</i> , nom. nov.	„ „ <i>rubi</i> .
<i>Chrysophanus virgaureæ inalpinus</i> , nom. nov.	<i>Chrysophanus virgaureæ</i> . Central-European race.
„ <i>hippotoë hippotoë</i> , L.	„ <i>hippotoë stieberi</i> , Ger.
„ „ <i>nirus</i> , nom. nov. ..	„ <i>hippotoë</i> . Central-European race.
<i>Lycæna idas</i> , L.	<i>Lycæna argyrognomon</i> , Bergstr.
„ <i>ramburi</i> , nom. nov.	„ <i>idas</i> , Ramb.
